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AUTHOR Williams, Clacy; Sneed, David
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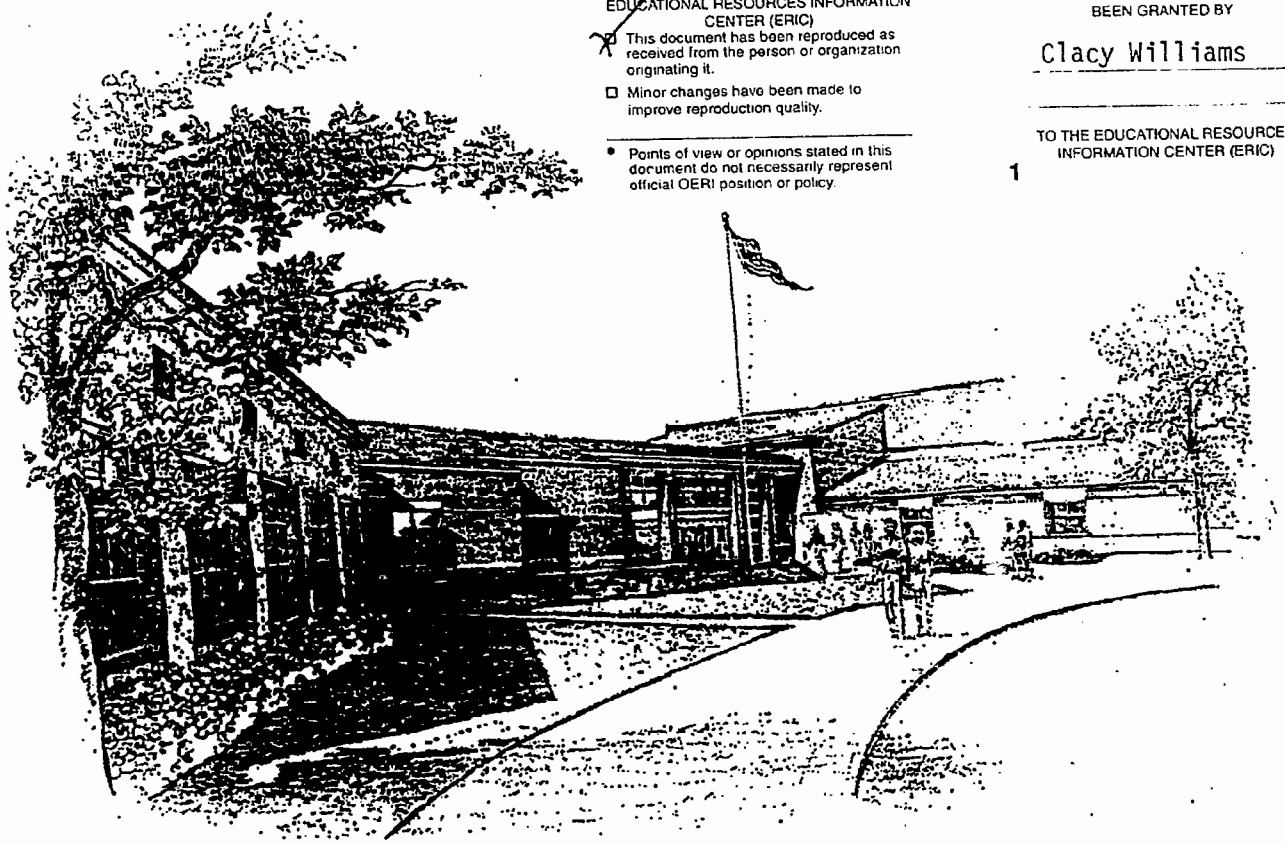
ABSTRACT

An outline and worksheets are provided for developing school design specifications that will meet the educational needs of students. The outline lists and briefly describes the key elements required of an educational specifications report, including a brief description of the community, the curriculum and support plans, building space requirements, a technology plan, and design criteria and general architectural considerations. Step-by-step outlines are presented to assist in the development of a comprehensive educational facilities plan and school construction project. (GR)

TRANSLATING EDUCATIONAL NEEDS INTO SCHOOL FACILITIES



SCHOOL BUILDING AUTHORITY OF WEST VIRGINIA

GASTON CAPERTON, GOVERNOR

Presentation by
Clacy Williams, Executive Director
David Sneed, Chief of Architectural Services

SCHOOL BUILDING AUTHORITY OF WEST VIRGINIA

TRANSLATING EDUCATIONAL NEEDS INTO SCHOOL FACILITIES THROUGH EDUCATIONAL SPECIFICATIONS

By constructing educational specifications, the learning activities, the number, groupings and nature of the people involved, the spatial relationships between sections of the facility, the interrelationships of instructional programs with each other as well as noninstructional spaces and the major furniture/equipment needs for the new facility can be defined and more easily understood. Each Ed.Spec.Committee consists of representatives from education, individuals from the community and architectural personnel selected by the board of education.

When specifications are agreed upon and committed to a written document, the architect is provided the greatest opportunity to design a school that more nearly meets the needs of the educational program and facilitates the activities that will be occurring in the spaces. To that end, and to more readily value the scope of the project, it is essential that an educational specifications document accompany the schematic drawings submitted to the SBA for review prior to approval by the local board of education.*

To be consistent and assist in understanding the issues to be included in the educational specifications, the following outline is provided but should not be considered all inclusive should other issues be of concern to you and your planning committees.

I. Introduction

A short synopsis describing the configuration of the educational structure, the projected number of students, site location, availability of site utilities, existing availability of ancillary facilities and spaces (ie. athletic etc.) and proposed statistics for the new construction.

II. The Community

A brief description of the community, its history, specific cultural distinctions and maps showing geographic characteristics, attendance areas (present and proposed) and the site location.

III. The Educational Plan

The educational plan can be subdivided into two general areas:

A. Curriculum Plan - States the schools philosophy, educational goals and objectives of the program. This should clarify important issues and priorities for consideration in the planning of the new facility.

B. Support Plan - Provides staffing information including teachers, instructional aides, food service personnel, counselors, custodial staff, and administrative staff including principals, assistant principals, department heads etc.

IV. Building Space Requirements

The utilization of space is extremely important. The SBA requires a minimum 85% utilization of newly constructed schools or schools where building additions are being proposed. In order to assist in developing Section IV, worksheet #1, which compiles data from the calculation of spaces for the new facility, must be completed and incorporated into Section IV.

The final number of allowable classrooms and the square footage for any facility that incorporates SBA funds will be determined by the SBA staff upon consideration of the program needs, building utilization rates, maximization of multi-use spaces in the design and the potential construction of the project within the allocated funds available.

In order to assure appropriate spaces and utilizations for the projected enrollment, room numbers and labels should be assigned to instructional areas on the schematic drawings and a model student schedule developed using Worksheet #2 to locate students and staff within the facility during each of the instructional periods of the day.

The following formula is to be utilized to determine the maximum number of classrooms that may be considered in each curricular area:

*FORMULA FOR DETERMINING TEACHING STATIONS PER SUBJECT AREA***

$$\frac{\text{Number of students enrolled in subject}}{\text{Maximum class size (see reference sheet)}} \times \frac{\text{Number of periods per week in subject}}{\text{Maximum number of periods per week (every period, every day)}} = \text{Number of teaching stations for this subject area}$$

V. Space Allocations

This section describes the instructional areas (general classrooms, PE areas, tech. ed. labs, science areas, consumer and homemaking areas, special education spaces, administrative offices etc.). Middle/Junior and High School departmentalization, specialization of spaces, electives and scheduling are factors to be considered in determining the number of teaching stations. The maximum number of teaching stations may be determined by applying the formula provide in Section IV to each subject area. The following description of each subject area is needed and should include:

A. Goals - What are the objectives to be accomplished in the area.

B. Space Required - Submit the calculations from the formula in Section IV to identify the number of spaces needed in this subject area and complete worksheet #1 attached. Teacher planning areas must be provided in building design allowing maximum use of teaching stations.

C. Planned Activities - Include specific actions to be performed in an area such as paint, read, science experiments, audio visual presentations, telecommunications, robotics lab, multiple use areas, etc.

D. Number of Users - Determine the number of administrators, teachers, aides and pupils to use the area at any one time.

E. Group Usages - Identify if the area is to be used for large or small group instruction, individual student work, team teaching, multiple usage, etc.

F. Spatial Requirements - Identify the spatial relationships of any one space to other areas of the facility whether inside or outside - near to or away from, convenient to media center (as with language arts areas), capability for combining or subdividing areas, the frequency of such adjustments and the square footage needed to do so, etc. Bubble diagrams should be used to show interrelationships of spaces.

G. Support Facilities - Spaces that allow the area to meet its goals: shared storage areas, teacher preparation areas, student work/storage areas, conference rooms, etc.

H. Environmental Considerations - Acoustical, Visual, Thermal, Climatic and Aesthetic considerations that enhance the practical usage of the specific space.

I. Utility Needs - Utilities needed in the specific area including: water, electrical, toilets, 3-phase power, gas, vacuum capability, telephone, technology wiring, etc.

J. Storage - More specific direction as to the cubic feet of storage needed in the specific area. Generally, this denotes built-in storage areas & closets.

K. Display Areas - Chalkboards, bulletin boards, display cases (linear feet).

L. Furniture and Equipment - quantities and types of items to be used in each area.

M. Technology - Specific needs of each space to accommodate the technological delivery system/network incorporated into the facility.

N. Other - Identify any other specific information essential to each specific area.

VI. Technology Plan

A technical plan for delivery of media, voice, data, graphics, text and telecommunications throughout the school includes a description of the instructional and administrative objectives, the technical structure needed to facilitate the system, the equipment needed to implement the system and the physical/design requirements for incorporating the system into the construction of the facility. The technology plan will be developed according to the Department of Education's Office of Technology & Information Systems' guidelines and submitted to them and the SBA for approval with design development documents.

VII. Design Criteria and General Architectural Considerations

This section should regard the total school complex but may be specified in distinct areas or regard special concerns. Following are some suggested considerations:

A. Health and safety
B. Quality of building systems and components
C. Economies to be attained - instructional, operational, maintenance
D. Flexibility and multi-use of spaces
E. Efficient circulation patterns
F. Community use considerations
G. Communication systems - may be incorporated into the Technology Plan
H. Accessibility
I. Building security
J. Student supervision

VIII. Educational Specifications Committee Page

A signature page for members comprising the ed spec committee will be included. Names will be organized by the group each individual represents, ie., Teachers, Administrators, Parents, Community Leaders, Design Professionals, etc.

School Building Authority of West Virginia
2300 Kanawha Blvd. E
Charleston, WV 25301
(304) 558-2541

***Architects** - Please be advised that an SBA review will not occur without submittal of educational specifications with schematic drawings instead of design development as previously required.

**Bibliography:

A. Conrad, MJ., *A Manual for Determining the Operating Capacity of Secondary Schools.* Bureau of Educational Research and Service, OSU.
B. Castaldi, Basil, *The Castaldi Nomogram.* The New England School Development Council.
C. CEFPI, Phoenix, AZ, *A Guide for Planning Educaitonal Facilities*

WORKSHEET #1

SUMMARY OF SPACES FROM CALCULATIONS IN SECTION IV

CURRICULAR AREA	NO. OF CLASSROOMS (According to formula)*	# STUDENTS	SBA USE
SUBTOTAL/TOTAL	_____		

* Classroom numbers from the formula are not to be rounded to the nearest whole number, insert the actual answer from the formula. Example: Language Arts -- 3.4 classrooms

Eedspec/cw/6-95

SBA SUBJECT AREA SPACE ALLOCATION DATA

WORKSHEET #2

Project Name_____ Prepared by_____

Date_____ Design Enrollment_____ Periods Per Day_____

Rm #	Teacher	Course	Number of Students Per Period								
			1	2	3	4	5	6	7	8	
SUBTOTALS / TOTALS											

Sched.wks/cw/6-95

WORKSHEET #3

SCHOOL BUILDING AUTHORITY OF WEST VIRGINIA
UTILIZATION WORKSHEET

County:_____ Project:_____Design Enrollment:_____

PROGRAM UTILIZATION:

Number of Classrooms X	Maximum Pupils =	Program Capacity
	70	
	40	
	36	
	35	
	25	
	20	
	15	
	12	
	10	
	8	
	6	
Totals:_____		_____

_____ ÷ _____ = _____
Design Enrollment Program Capacity PROGRAM UTILIZATION %

BUILDING UTILIZATION:

_____ X _____25_____ = _____
Total Classrooms Maximum Pupils Building Capacity

_____ ÷ _____ = _____
Design Enrollment Bldg. Capacity BUILDING UTILIZATION %

INSTRUCTIONS FOR SBA UTILIZATION WORKSHEET #3

The utilization worksheet is intended to be used to identify basic program and building utilizations for program offerings in existing or proposed school facilities. The program utilization and building utilization will vary as course offerings are introduced or eliminated. A minimum program utilization of 85% is required for all proposed new facilities being constructed with SBA funding. Higher building program utilization may be required by the SBA where student enrollment projections show expected decline.

Instruction for completion of the utilization worksheet:

County:	Indicate the name of the county proposing the school project
Project:	Indicate the name of the project that is proposed
Design Enrollment:	Indicate the number of students the facility is being designed to house, eighth year projection or as approved by the SBA

Program Utilization:

Number Classrooms: section	Enter the total number of classrooms of like capacity from the formula calculations in VII of the outline for educational specifications.
Program Capacity: on	Multiply the number of classrooms by the Maximum pupils shown in the middle column the worksheet and indicate the product of the two in the program capacity column
Totals:	Sum both the Number of Classrooms column and the Program Capacity column
Program Utilization:	Calculate by dividing the design enrollment (as approved by the SBA) by the sum of the program capacity - should equal 85% or greater after calculations are completed

Building Utilization:

Total Classrooms:	Indicate the total number of classrooms being provided (equal to the number of classrooms used in the program utilization calculations above)
Maximum Pupils:	For building utilization purposes, this number will always be 25 pupils
Building Capacity:	Indicate the product of the total number of classrooms multiplied by the maximum possible pupils per classroom (25)
Building Utilization:	Insert the design enrollment and divide by the total building capacity number above, Should equal a minimum of 85% or an SBA approved utilization rate before proceeding with the building design

SCHOOL BUILDING AUTHORITY OF WEST VIRGINIA **Maximum Class Sizes**			
Classroom Type	**EL**	**MS**	**HS**
Kindergarten & Transitional Kindergarten	20		
General Instruction Areas	25	25	25
Corrective or Remedial Education	15	15	15
Art Rooms (Optional/Elem)	25	25	25
Driver Education Facilities			25
Consumer/Homemaking Classroom (Optional)		25	25
Consumer/Homemaking Lab		25	25
Foreign Language Facilities		25	25
Foreign Language Lab (Optional)		25	25
Technology Education		20	
Music Facilities (Optional Elementary)	25	25	40
Ensemble Room (Optional)			12
Physical Education	25	70	70
Science Facilities		25	20
Micro-Computer Lab	25	20	20
ElectronicTechnology Lab (Optional)		75	
Auditorium (33% of total student body)			
Behavior Disorders	8	8	8
Communication Disorders (Self Contained)	12	12	12
Deaf/Blind (Self Contained)	3	3	3
Mildly Mentally Impaired (Self Contained)	12	12	12
Moderately Mentally Impaired (Self Contained)	12	12	12
Orthopedically Impaired (Self Contained)	10	10	10
Severely/Profoundly Mentally Imparied (Self Contained)	9	9	9
Hearing Impaired Education (Self Contained)10	10	10	10
Visually Impaired Education (Self Contained)	10	10	10
Specific Learning Disabilities (Self Contained)	12	12	12

SCHOOL BUILDING AUTHORITY OF WEST VIRGINIA Maximum Class Sizes			
Classroom Type	**EL**	**MS**	**HS**
Pre-School Handicapped (Self Contained)	10		
Gifted Education (Self Contained)	15	15	15
Resource Services (Regular Program Support)	15	15	15
Agricultural Education			20
Agricultural Mechanics Lab			20
Marketing Education			25
Diversified Cooperative Training			25
Vocational Health Occupations			25
Health Occupations Lab			25
Consumer and Homemaking (Occupational)			25
Food Management, Production & Servuces (Occ)			20
Care & Guidance of Children			20
Fashion Management			20
Institutional & Home Mangement (Occ)			20
Vocational-Industrial and Technical Classrooms			20
Industrial and Technical Lab			20
Business Education Classroom			20
Computer/Keyboarding Lab			30
Office Technology			20
Tech Ed. Production Lab			20
Tech Ed. Systems Lab			20

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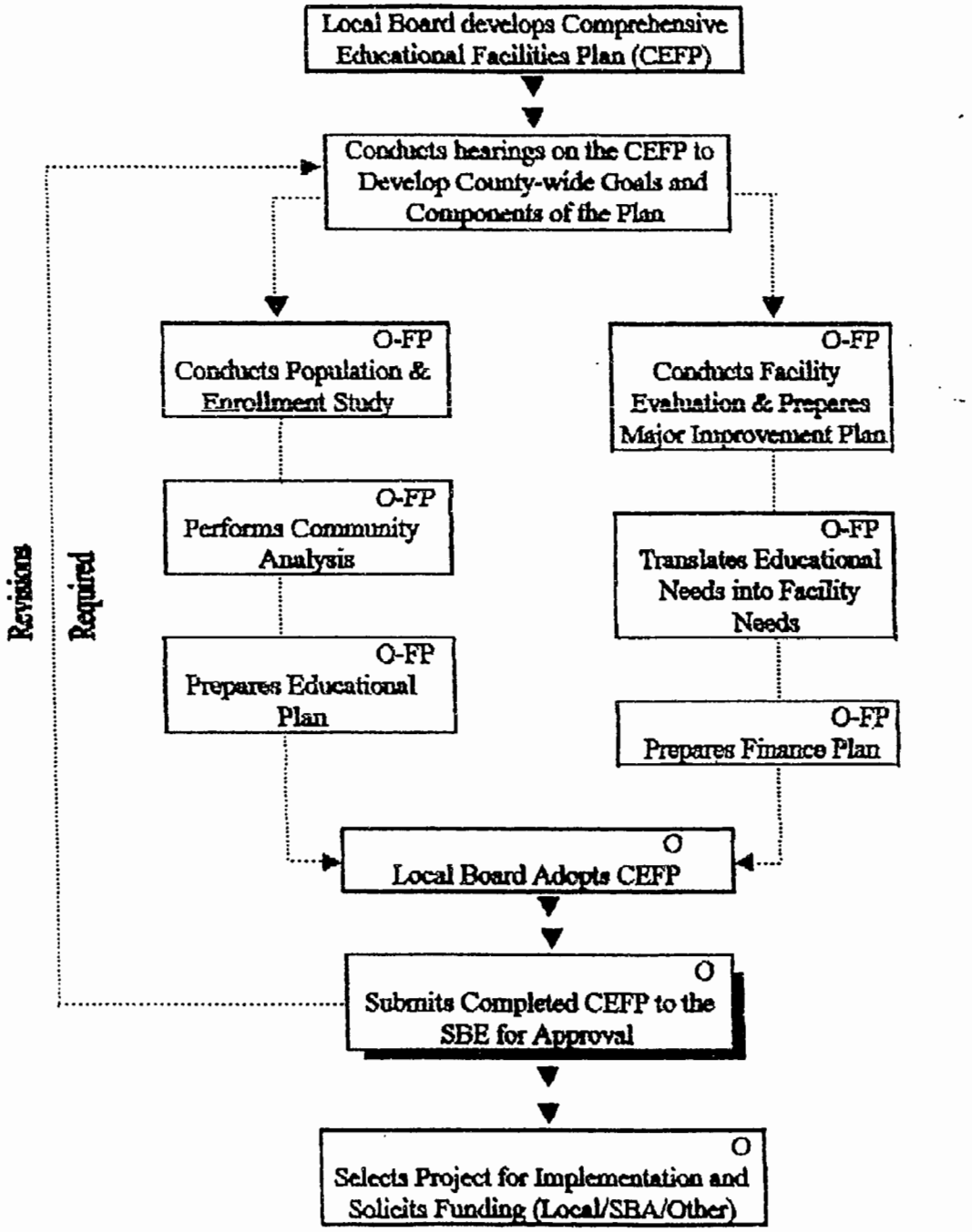
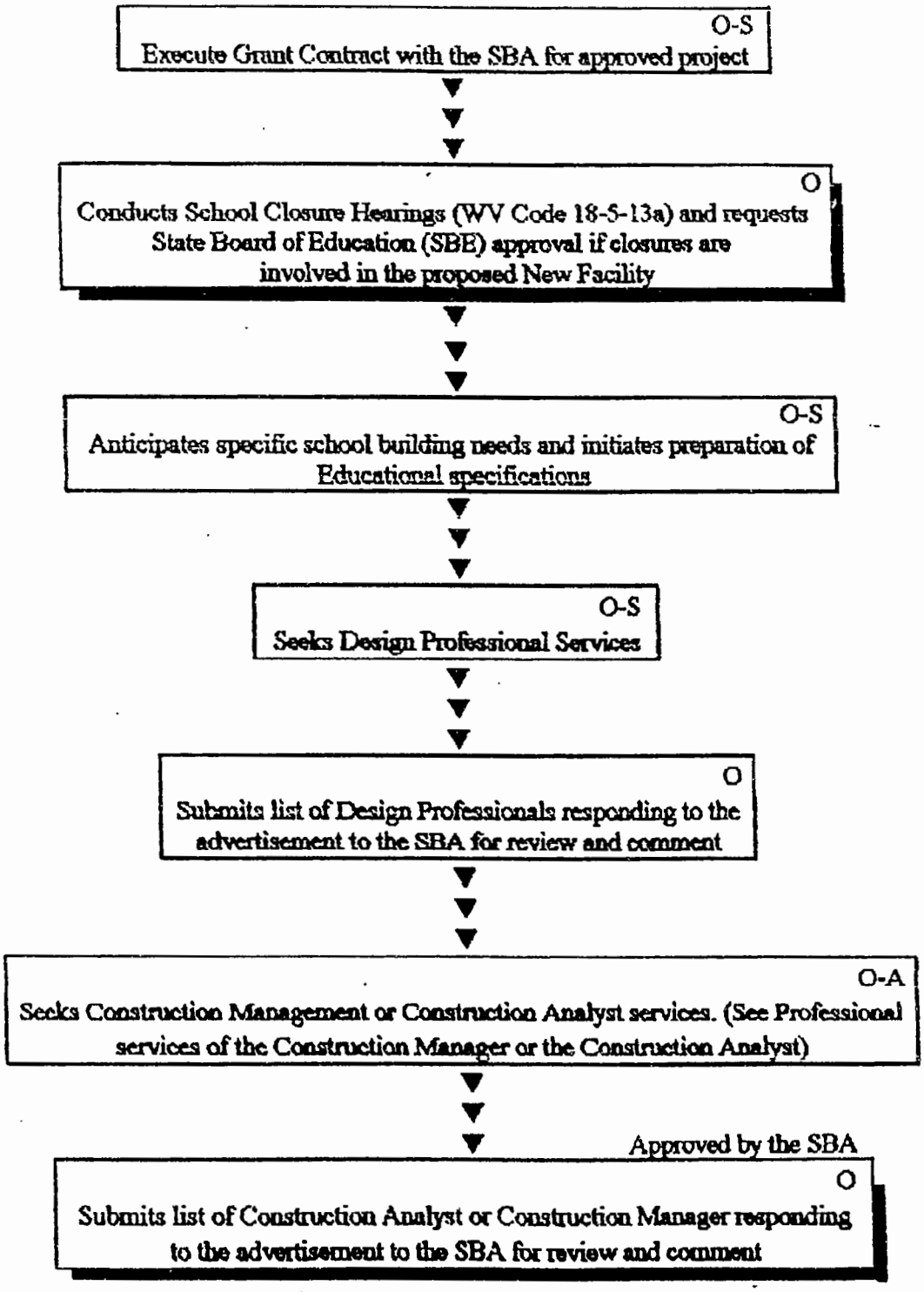
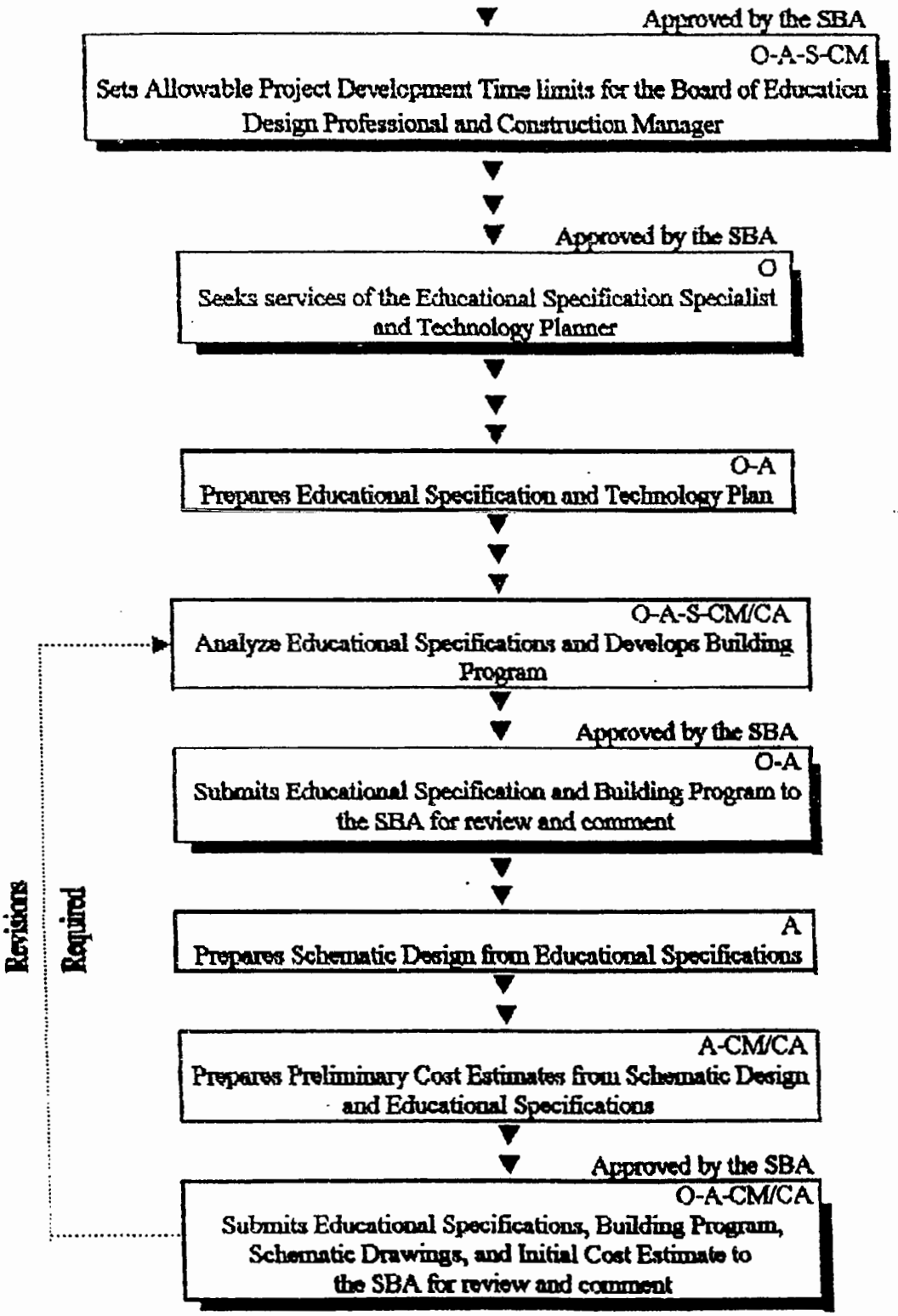
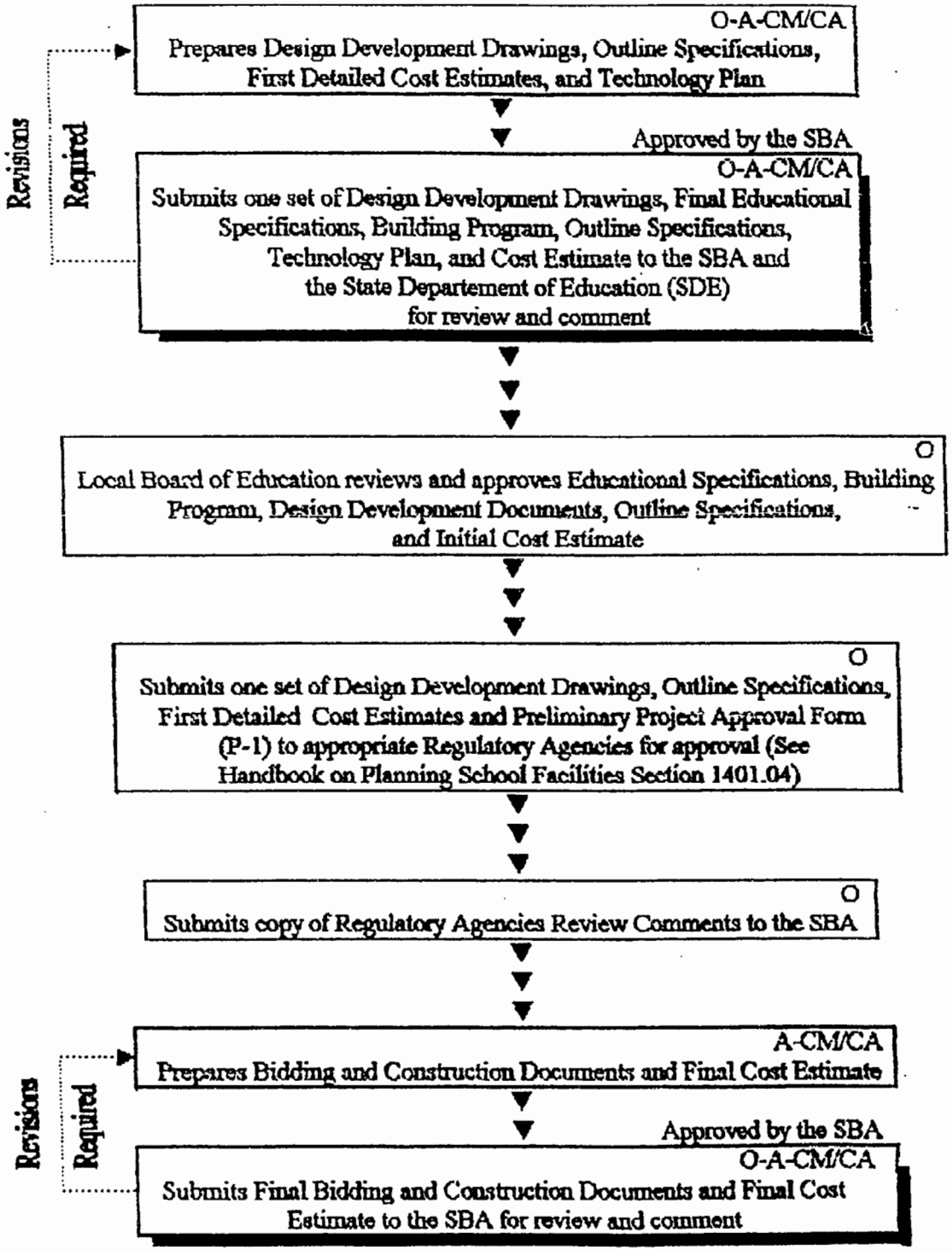
COMPREHENSIVE EDUCATIONAL FACILITIES PLAN DEVELOPMENT

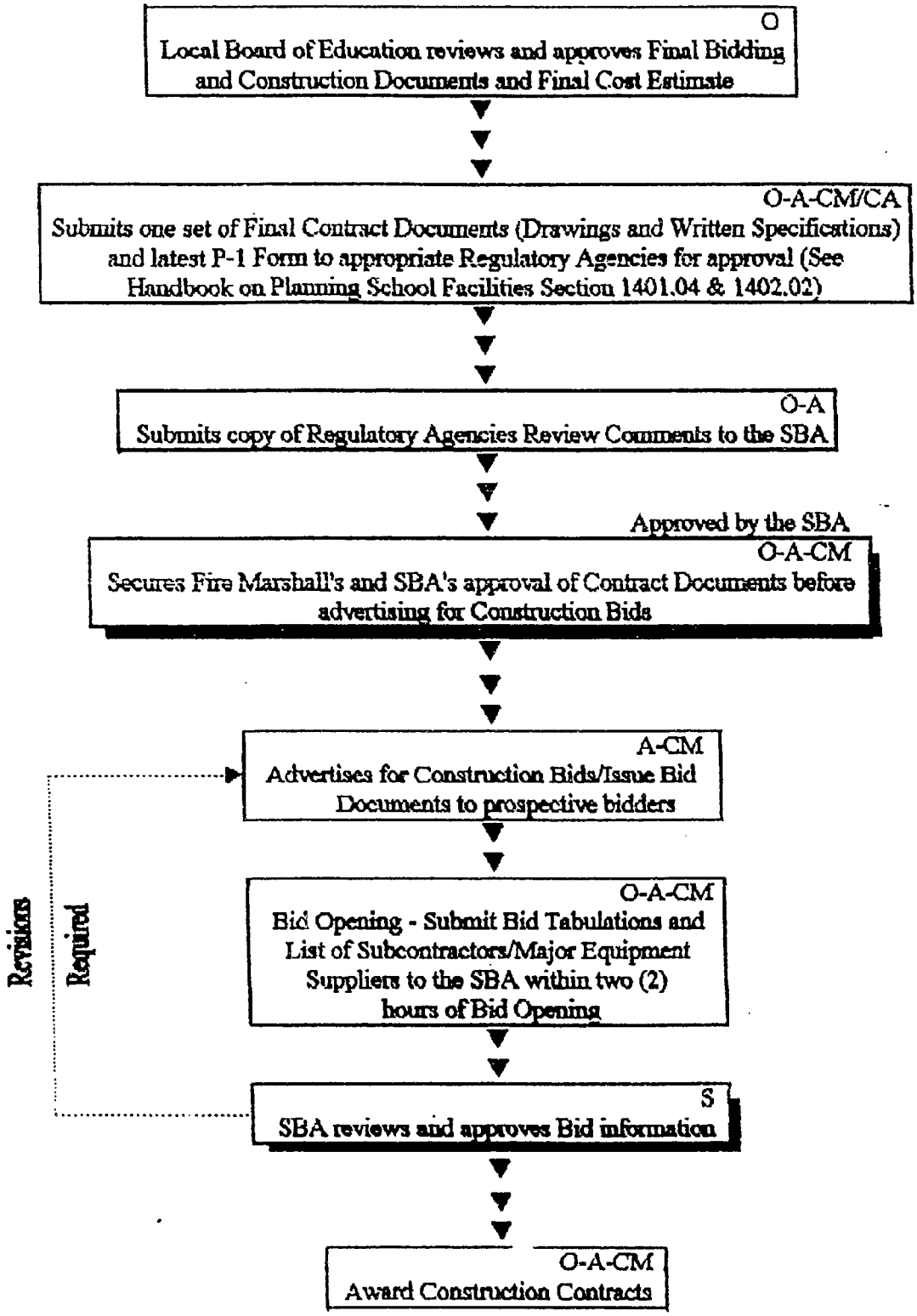


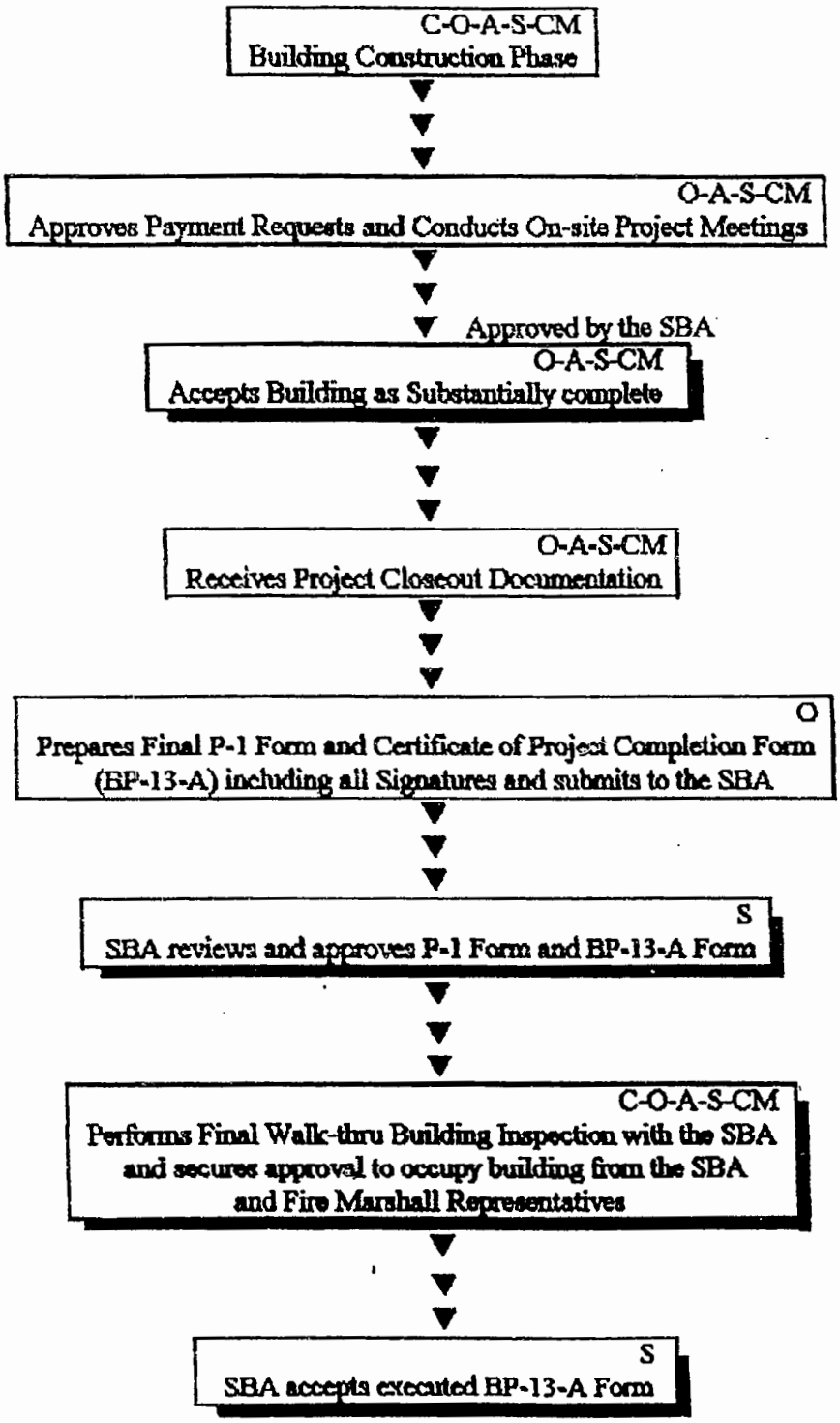
SCHOOL CONSTRUCTION PROJECT DEVELOPMENT

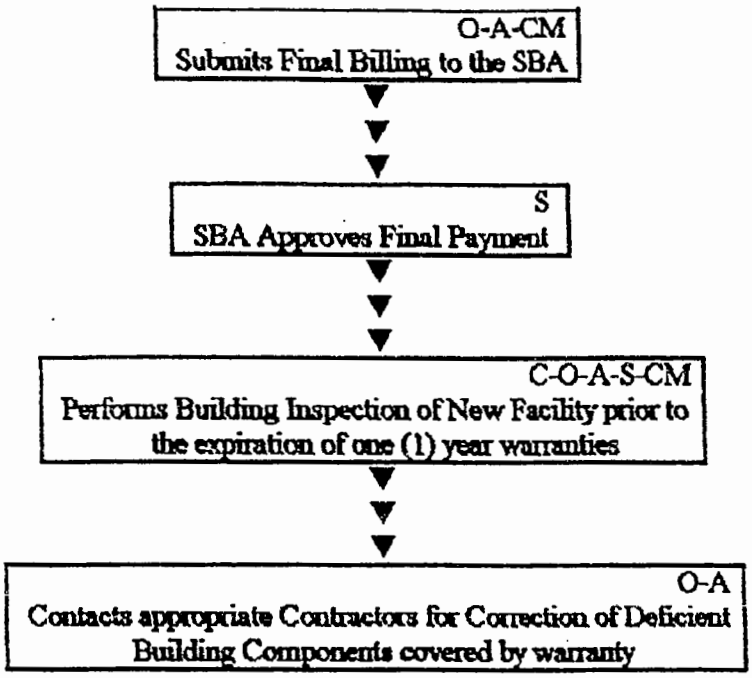



Approved by the SBA
O-A-S-CM
Sets Allowable Project Development Time limits for the Board of Education Design Professional and Construction Manager
Approved by the SBA
O
Seeks services of the Educational Specification Specialist and Technology Planner
O-A
Prepares Educational Specification and Technology Plan
O-A-S-CM/CA
Analyze Educational Specifications and Develops Building Program
Approved by the SBA
O-A
Submits Educational Specification and Building Program to the SBA for review and comment
A
Prepares Schematic Design from Educational Specifications
A-CM/CA
Prepares Preliminary Cost Estimates from Schematic Design and Educational Specifications
Approved by the SBA
O-A-CM/CA
Submits Educational Specifications, Building Program, Schematic Drawings, and Initial Cost Estimate to the SBA for review and comment
Revisions Required


O-A-CM/CA
Prepares Design Development Drawings, Outline Specifications, First Detailed Cost Estimates, and Technology Plan
Approved by the SBA
O-A-CM/CA
Submits one set of Design Development Drawings, Final Educational Specifications, Building Program, Outline Specifications, Technology Plan, and Cost Estimate to the SBA and the State Departement of Education (SDE) for review and comment
Revisions Required
O
Local Board of Education reviews and approves Educational Specifications, Building Program, Design Development Documents, Outline Specifications, and Initial Cost Estimate
O
Submits one set of Design Development Drawings, Outline Specifications, First Detailed Cost Estimates and Preliminary Project Approval Form (P-1) to appropriate Regulatory Agencies for approval (See Handbook on Planning School Facilities Section 1401.04)
O
Submits copy of Regulatory Agencies Review Comments to the SBA
A-CM/CA
Prepares Bidding and Construction Documents and Final Cost Estimate
Approved by the SBA
O-A-CM/CA
Submits Final Bidding and Construction Documents and Final Cost Estimate to the SBA for review and comment
Revisions Required


O
Local Board of Education reviews and approves Final Bidding and Construction Documents and Final Cost Estimate
O-A-CM/CA
Submits one set of Final Contract Documents (Drawings and Written Specifications) and latest P-1 Form to appropriate Regulatory Agencies for approval (See Handbook on Planning School Facilities Section 1401.04 & 1402.02)
O-A
Submits copy of Regulatory Agencies Review Comments to the SBA
Approved by the SBA
O-A-CM
Secures Fire Marshall's and SBA's approval of Contract Documents before advertising for Construction Bids
A-CM
Advertises for Construction Bids/Issue Bid Documents to prospective bidders
O-A-CM
Bid Opening - Submit Bid Tabulations and List of Subcontractors/Major Equipment Suppliers to the SBA within two (2) hours of Bid Opening
S
SBA reviews and approves Bid information
Revisions Required
O-A-CM
Award Construction Contracts


C-O-A-S-CM
Building Construction Phase
O-A-S-CM
Approves Payment Requests and Conducts On-site Project Meetings
Approved by the SBA
O-A-S-CM
Accepts Building as Substantially complete
O-A-S-CM
Receives Project Closeout Documentation
O
Prepares Final P-1 Form and Certificate of Project Completion Form (BP-13-A) including all Signatures and submits to the SBA
S
SBA reviews and approves P-1 Form and BP-13-A Form
C-O-A-S-CM
Performs Final Walk-thru Building Inspection with the SBA and secures approval to occupy building from the SBA and Fire Marshall Representatives
S
SBA accepts executed BP-13-A Form



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EXPLANATION OF ABBREVIATIONS THAT INDICATES WHO WILL PERFORM TASK:

A = Architect

C = Contractor

CA = Construction Analyst (When applicable)

CM = Construction Manager (When applicable)

FP = Facilities Planner

O = Owner

S = School Building Authority

SBE = State Board of Education

SDE = State Department of Education